NON-PUBLIC?: N
ACCESSION #: 8808300052

LICENSEE EVENT REPORT (LER)

FACILITY NAME: Plant Vogtle - Unit 1 PAGE: 1 of 5

DOCKET NUMBER: 05000424

TITLE: Failed Connector On Transmission Line Disconnect Leads to Reactor Trip
EVENT DATE: 07/30/88 LER #: 88-024-00 REPORT DATE: 08/22/88

OPERATING MODE: 1 POWER LEVEL: 100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: J. E. Swartzwelder, Nuclear Safety and Compliance Manager
TELEPHONE #: 404-826-3618

SUPPLEMENTAL REPORT EXPECTED: No

ABSTRACT: On July 30, 1988 at 1524 CDT, a reactor trip occurred on Unit 1 with the plant at approximately 100% of rated thermal power. The reactor trip was initiated by a turbine trip, which resulted from a generator trip. The generator trip was initiated by protective relays due to a fault on the phase "A" section of the disconnect switch of the Main Transformer output.

There was a failure (blowout) of a terminal pad where the 230kv transmission line connects to the disconnect switch. Evidence indicates that a crack occurred in the pad which led to arcing and overheating causing the blowout of the connector.

Several corrective actions were taken which include the following. The failed and damaged parts were replaced. An infrared scan was performed on other connection points to identify any hot spots. Also the disconnect switch is scheduled to be replaced with a newer type during the refueling period.

(End of Abstract)

A. REQUIREMENT FOR REPORT

This report is required per 10CFR50.73(a)(2)(iv) because there was an automatic actuation of the Reactor Protection System, due to an unplanned automatic reactor trip.

B. UNIT STATUS AT TIME OF EVENT

Unit 1 was in Mode 1 (Power Operation) with the reactor operating in normal steady state conditions at approximately 100% of rated thermal power. The reactor coolant system pressure and temperature were approximately 2235 psig and 588 degrees fahrenheit, respectively.

C. DESCRIPTION OF EVENT

On July 30, 1988 at 1524 CDT, a reactor trip occurred on Unit 1 with the plant at approximately 100% of rated thermal power. The reactor trip was initiated by a turbine trip, which resulted from a generator trip. The generator trip was initiated by several protective relay signals due to a fault on phase "A" on the 230KV output side of the main transformer. During the normal reactor trip transient, generator low level setpoints were reached initiating an expected Auxiliary Feedwater (AFW) actuation. At approximately 1547 CDT, the plant was stabilized in mode 3 (Hot Standby) with reactor coolant system temperature and pressure at approximately 557 degrees fahrenheit and 2235 psig, respectively.

This event occurred due to a fault at the phase "A" disconnect switch, 161716, on the output side of the Main Step-up Transformer. The fault caused unbalanced and high currents in phases "A" and "C" of the generator output (25KV) and phase "A" and the neutral of the output (230KV) of the main step-up transformer. This activated several of the generator protective relays initiating the generator trip. Inspections and testing were performed to determine if any damage had occurred to the generator, generator controls, and/or the main transformer, phase "A" section.

On July 31, 1988 at approximately 0800 CDT, the repair of the disconnect switch, 161716, was completed. At approximately 0952 CDT the testing and inspections for damage were completed and no damage was indicated. At approximately 1000 CDT actions were commenced for a reactor startup.

D. CAUSE OF THE EVENT

The reactor/turbine trip occurred because of the generator trip signal initiated by generator protective relays due to the fault on phase "A".

There is a disconnect switch on each phase of the 230 KV side of the Main Step-up Transformer. This switch serves to isolate the transformer from the transmission line. The fault occurred at the connection point where the transmission line connects to the disconnect switch. A picture of the connection point is shown below:

FIGURE OMITTED - NOT KEYABLE (PICTURE)

Transmission Line Terminal Pad
Connection

The cable for the transmission line connects to point D. There was a "blowout" at point C, disintegrating that section of the terminal pad. This allowed the phase A cable and Section D to fall away from the terminal pad. When the blowout occurred, it also damaged the upper section of the insulator.

The exact cause of the failure of the terminal pad is not known, however, evidence indicates it was stress induced metal fatigue resulting from one (1) or more of the following items:

1. When the installation of the cables was made there was not enough slack provided. Therefore, whenever the cable tightened, due to weather conditions (ie. wind or decrease in temperature), there was additional stress applied to the terminal pad.

2. The terminal pad is cast aluminum and there could have been an internal flaw in the terminal pad, when it was fabricated.

3. There could have been a fatigue or corrosion induced stress riser to the terminal pad.

It is strongly believed that for this type of failure a crack occurred in the terminal pad. The crack was then propogated by stress on the terminal pad, which led to arcing and overheating causing the blow-out of the terminal pad.

E. ANALYSIS OF EVENT

A turbine trip occurred as the result of the generator trip. The accident analysis indicates that the plant design is such that a turbine trip represents no hazard to the integrity of the RCS or the Main Steam System. The analysis shows that DNBR will not decrease below 1.30 at any time during the transient. Therefore the DNB design basis was not exceeded. Since the Engineered Safety Features Systems functioned as designed, the plant safety and the health and safety of the public was not affected by this event.

F. CORRECTIVE ACTIONS

The corrective actions for this event include the following:

1. Verified that no damage had occurred to the Generator, Generator Control Circuits, and the Main Step-up Transformer.

2. Replaced the failed and damaged parts of the disconnect switch 161716.

3. Infrared scan performed on the other terminal pads of the disconnect switch and no hot spots were identified. However, two (2) hot spots were identified on another disconnect switch on the 230kv line. These were corrected on August 7, 1988.

4. Georgia Power has evaluated the adequacy of this type of switch assembly and cable support and determined it is adequate. Howev
r, since there is a problem obtaining parts for this type of switch, a decision was made to replace it with a newer type so spare parts are readily available. This is scheduled to be accomplished during the refueling outage.

5. A scheduled PM program will be developed to perform infrared scanning by the Vogtle Maintenance Group of each Hi-Voltage side connections of the Main, Unit Auxiliary, and Reserve Auxiliary Transformers. This is scheduled for completion on September 15, 1988.

G. ADDITIONAL INFORMATION

1. Failed Component Identification

230 KV, 4000 Amp Disconnect Switch

Type AVB-3
Catalog No. R-2424010420
Manufacturer - Siemens-Allis

2. Previous Similar Events

None

3. Energy Industry Identification System Codes

Switchyard System - FK
Motor Operated Disconnect - MOD

This component is not reportable to NPRDS

ATTACHMENT # 1 TO ANO # 8808300052 PAGE: 1 of 1

the southern electric system

R.P. McDonald NON-00261
Executive Vice President 0010e
Nuclear Operations
August 22, 1988

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D. C. 20555

PLANT VOGTLE - UNIT 1
NRC DOCKET 50-424
OPERATING LICENSE NPF-68
LICENSEE EVENT REPORT
FAILED CONNECTOR ON TRANSMISSION
LINE DISCONNECT LEADS TO A REACTOR TRIP

Gentlemen:

In accordance with the requirements of 10 CFR 50.73, Georgia Power Company hereby submits a Licensee Event Report (LER) concerning an unplanned automatic reactor trip.

Sincerely,
/s/ R. P. McDonald
R. P. McDonald

HC/dmh

Enclosure: LER 50-424/1988-024

c: Georgia Power Company
Mr. P. D. Rice
Mr. G. Bockhold, Jr.
Mr. M. Sheibani
Mr. W. E. Burns
GO-NORMS
NORMS

U. S. Nuclear Regulatory Commission
Dr. J. N. Grace, Regional Administrator
Mr. J. B. Hopkins, Licensing Project Manager, NRR (2 copies)
Mr. J. F. Rogge, Senior Resident Inspector - Operations, Vogtle

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